The gradual loss of NPI-hood with 'need' verbs in Germanic

Germanic 'need' verbs exhibit a great deal of variation across time and languages with respect to three aspects: (i) the environments in which they are licensed (strength), (ii) the array of different syntactic patterns in which they can be used, such as transitive or raising verbs, (iii) and which of these patterns are restricted to negative polarity licensing contexts.

One important property of 'need' verbs in Germanic is that they come with various syntactic argument structures such as transitive verb with $\langle \text{NP}_{\text{nom}}\text{:EXP}, \text{NP}_{\text{acc/gen}}\text{:THEME} \rangle$, impersonal verb $\langle \text{NP}_{\text{acc/gen}}\text{:THEME} \rangle$, directional phrases $\langle \text{NP}_{\text{nom}}\text{:EXP}, \text{NP}_{\text{acc/gen}}\text{:THEME} \rangle$, with non-finite control or raising complements $\langle \text{NP}_{\text{nom}}\text{:EXP}, \text{VP}_{\text{bse/inf}}\text{:THEME} \rangle$ or finite clausal arguments $\langle \text{NP}_{\text{nom}}\text{:EXP}, \text{S}_{\textit{that}} \rangle$. As demonstrated by Lightfoot (1979), Sweetser (1990), Diewald (1999) and Roberts and Roussou (2003), the different uses of verbs with modal meaning develop at different stages in grammaticalisation. It is well known, that circumstantial uses with infinitives developed from transitive uses and that epistemic uses with infinitives developed from circumstantial uses:

(1) $\text{V}_{\text{trans}} > \text{V}_{\text{circumstantial}} + \text{INF} > \text{V}_{\text{epistemic}} + \text{INF}.$

Table 1 gives an overview over the NPI-hood of the different 'need'-verbs in the major germanic languages based on data from corpora (*Deutsches Textarchiv*, *Referenzkorpus Altdeutsch*, *Referenzkorpus Mittelhochdeutsch*, *Nordic Dialect Corpus and Syntax Database*, *Wulfila Project*), previous corpus studies such as Loureiro-Porto (2009) and historic dictionaries such as De Vries and Te Winkel (1882), Verwijs and Verdam (1947), *Svenska Akademiens Ordbok* and *Ordbog over det danske Sprog*.

As Table 1 indicates, there is an interesting correlation between the degree of grammaticalisation and the question whether a single use is distributionally unrestricted or restricted to negative polarity environments. At the one end of the scale, there is Dutch *hoeven*, which is always an NPI irrespective of the degree of grammaticalisation of the relevant uses, at the other end of the scale there is Swedish *behöva*, which is only used as an NPI in is most grammaticalised use, which is the epistemic one. All the transitive and circumstantial uses with infinitive of *behöva* are distributionally unrestricted. In the middle of the scale there are 'need' verbs like German *brauchen*, which is distributionally unrestricted whenever used as a transitive verb or impersonal verb, but which turns into an NPI whenever occurring with clausal complement. In case, some use of a 'need' verb is not attested it the relevant field of Table 1 shows a dash.

In a more global perspective it appears that the more grammaticalised the use of a verb is the more likely it is to retain its negative polar status. This assumption is further corroborated by the fact that of all the uses of English *can* it is only its most grammaticalised one which is restricted to negative polar environments, as shown by Hofmann (1976: 94), Brennan (1993: 14), Israel (1996: 630–631, 2011: 131–132), Drubig (2001: 43), Portner (2009: 30).
These data raise two questions: First of all, how do the different uses of 'need' verbs relate to each other in the lexicon? Is there a single entry or are there separate and independent entries? And secondly, why are more more grammaticalised 'need' verbs more likely to be NPIs?

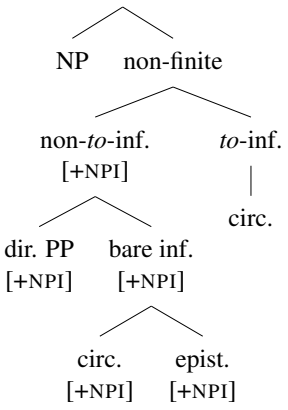
As regards the first question, it is assumed here that lexicon entries of modal verbs in general are organised in type hierarchies which relate all of the different uses to each other. On the top branch,

	intrans	trans	impers.	fin. clause	dir. PP	inf. circ.	inf. epist
Goth. *þaurban* + bare Inf.	–	NPI	–	NPI	NPI	NPI	–
O. Sax. *thurƀan* + bare Inf.	–	–	–	–	NPI	NPI	–
O. Eng. *þurfan* + bare Inf.	–	?NPI	–	–	–	NPI	–
O. H. Ger. *thurfan* + bare Inf.	NPI	NPI	–	–	NPI	NPI	–
M. H. Ger. *thurfan* + bare Inf.	NPI	NPI	–	–	NPI	NPI	–
Mod. Dt. *hoeven* + *te*-Inf.	–	NPI	NPI	–	NPI	NPI	NPI
Mod. Ger. *brauchen* + (*zu*)-Inf.	–	unrestr.	unrestr.	NPI	NPI	NPI	NPI
Mod. Den. *behøve* + (*at*)-Inf.	–	unrestr.	–	–	–	NPI	NPI
Mod. Eng. *need* + bare Inf.	–	unrestr.	–	–	–	NPI	NPI
Mod. Nor. *trenge* + bare Inf.	–	unrestr.	–	–	–	NPI	NPI
Mod. Den. *behøve* + bare Inf.	–	unrestr.	–	–	–	NPI	NPI
Mod. Swe. *behöva* + bare Inf.	–	unrestr.	–	–	–	unrestr.	NPI
Mod. Isl. *þurfa* + *að*-Inf.	–	unrestr.	–	–	(unrestr.)	unrestr.	NPI
Mod. Nor. *behøve* + *å*-Inf.	–	unrestr.	–	–	–	unrestr.	–
Mod. Nor. *trenge* + *å*-Inf.	–	unrestr.	–	–	–	unrestr.	–
Mod. Engl. *need* + *to*-Inf.	–	unrestr.	–	–	–	unrestr.	–

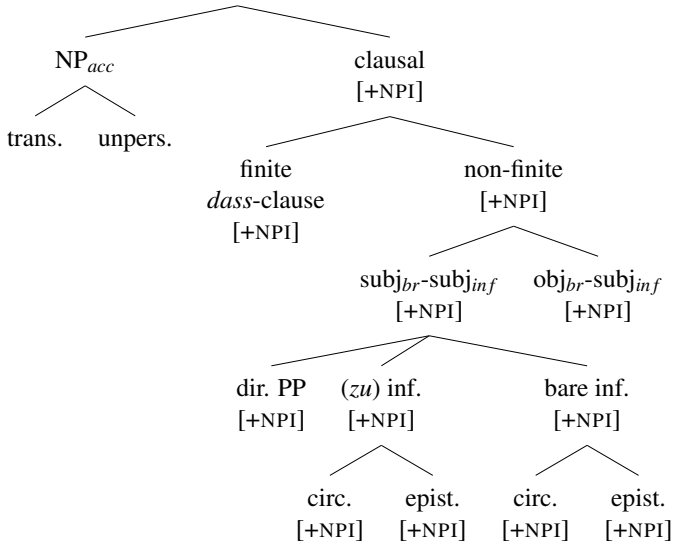
Table 1: Distribution of NPI uses of 'need' verbs in Germanic languages

there is the least grammaticalised use, and the more deeper in the tree, the more grammaticalised uses tend to be (cf. 2–3)

(2) Engl. *need*



(3) German *brauchen*



This internal structure of lexical polysemous verbs is motivated by evidence from language acquisition, which is the main force behind grammaticalisation (cf. Paul 1920: 34 §18, Lightfoot 1979: 375, Lightfoot 1998: 18). Following Green's (2011) concept of *Type Differentiation*, acquisition of new forms can be understood as branching the old underspecificed form into two more specified forms that are contrasted by conflicting feature values. Thus, grammaticalisation of new forms can be sketched as follows: at some points of their development a $form_1$ with the feature F specified as a_1 will be reanalysed. Which means it will lose its specification. In the learner's lexicon this is going to be expressed as the assumption of a super type $form_0$ with a underspecified feature F. At the same time, the L1-learner has space to assume a more grammaticalised $form_2$ with a feature value a_2 which reflects a higher degree of grammaticalisation.

To illustrate this mechanism, assume the first stage of acquisition in which the transitive use of the 'need' verb is acquired, consider the initial entry for German *brauchen*.

(4) $\left[\text{SC}\ \left\langle \text{NP}[str]_{\boxed{1}},\ \left[\text{HEAD}\ \left[\begin{array}{l}\text{AGR|CASE}\ str\\ noun\end{array}\right]\right]\right\rangle\right]$

Once the L1-learner is exposed to data which suggest that the THEME-argument might also be realised as infinitive, a reanalysis takes place (i) which causes the category of the second argument to become underspecified and (ii) which introduces two daughters one bearing the old value *noun* and a second daughter bearing the new value *verb*, yielding a control infinitive structure. This models exactly the data for L1 acquisition of modality and 'need' verbs gathered by Cournane (2014), Cournane (2015), and Hacquard and Cournane (2016), Lin (2016) and Lin, Weerman, and Zeijlstra (2015), Lin, Weerman, and Zeijlstra (2017).

(5)

$$\left[\text{ARG-ST}\ \left\langle \text{NP}[str]_{\boxed{1}},\ \left[\text{HEAD}\ noun\text{-}\vee\text{-}verb\right]\right\rangle\right]$$

$$\left[\text{ARG-ST}\ \left\langle \text{NP}[str]_{\boxed{1}},\ \left[\text{HEAD}\ \left[\begin{array}{l}\text{AGR|CASE}\ str\\ noun\end{array}\right]\right]\right\rangle\right] \qquad \left[\text{ARG-ST}\ \left\langle \text{NP}[str]_{\boxed{1}},\ \left[\text{HEAD}\ \left[\begin{array}{l}\text{SUBJ}\ \langle \text{NP}[str]_{\boxed{1}}\rangle\\ \text{VFORM}\ bse\\ verb\end{array}\right]\right]\right\rangle\right]$$

Turning to the second question, there seems to be a principle at work: if any use of a 'need' verb bears the NPI feature all the remaining uses which subsequently grammaticalised out of it bear that feature too. This exactly accounts for the vast variation on NPI uses among 'need' verbs in Germanic as illustrated in Table 1. In the case of Dutch, the NPI feature takes is in the top node and inherited to all possible uses; in English the NPI feature only applies to non-finite uses without *to* (cf. 2) and in German, the NPI feature extends to all the uses which involve a clausal complement (cf. 3).

Tackling to the question why the distribution of NPI uses is so heterogenous in Modern Germanic languages, it is recommended to take a look at earlier stages: as illustrated in Table 1, the earliest documented stages Gothic, Old Saxon, Old High German and Old English involve a 'need' verb *thurfan* and its cognates which is (almost) exlusivly found in NPI licensing environments, all above in the scope of a negation and in interrogatives, in Gothic and in Modern Swedish it appears that relative clauses can license NPIs, too. At least it is remarkable that many of the instances which do not occur in well known NPI-licensing contexts are found in relative clauses:

(6) sumai mundedun, ei unte arka habaida Iudas,
some-M.NOM.P mean-PRET-3P that until/so.lange box-ACC.S have-PRET-3S Iudas
þatei qeþi imma Iesus: bugei [$_{\text{REL-CL}}$ þizei
that say-OPT.PRET.3P him-M.DAT.S Iesus: buy-IMP REL.GEN.S
þaurbeima du dulþai], aiþþau þaim unledam ei
need-OPT.PRS.1P to feast-DAT or DEM.M.DAT.P poor-DAT.P for.that
hva gibau.[1]
something-ACC give-OPT.PRS.1S
'For some of them thought, because Judas had the bag, that Jesus had said unto him, Buy those things that we have need of against the feast; or, that he should give something to the poor.'

[1] *Wulfila Bible* Codex Argenteus, John 13:29

(7) det var ju mycket som skulle – alla lysrör [$_{\text{REL-CL}}$ som behövde
there was PRT a.lot that FUT.AUX <break> all neon.lamps REL needed
skiftas] och andra __UNDEF__ ljuspunkter[2]
replace-PST.PASS and other ??? light.spots
'. . . neon lamps which needed to be replaced . . . .'

The behaviour of 'need' verbs in known studied stages of Germanic languages suggests thus that the common Protogermanic ancestor **þurƀan* must have been negative polar covering all its uses from transitive to clause embedding uses (cf. Birkmann 1987: 371–373 on the phonological reconstruction).

It will be shown that almost all the 'need' verbs in Germanic have undergone an erosion of their negative polarity to some extent, in some languages such as Danish the transitive uses are no longer NPIs, in others such as Icelandic transitive and circumstantial uses lost their NPI status and the English NPI *need* + bare infinitive is increasingly replaced by a non NPI *need* + *to*-infinitive (cf. Müller 2008).

The development in the various languages indicates that both scenarios for the loss of negative polarity can be found, replacement by a new distributionally unrestricted form (cf. Hoeksema 1998) and the loss of negative polarity (cf. Jäger 2010).

Comparing the various Modern Germanic languages, van der Wouden (2001) and Richter and Soehn (2006) observed that 'need' verbs are licensed by a different types of licensing contexts in different languages. It is argued here that the more there are NPI licensing contexts in a language, the more difficult it is for L1 to recognise a given use as NPI in the input data, hence the more likely it is this use is going to lose its NPI-hood. In a similar manner, Goldberg (2019: 101–104) observes that L1-learner tend to simplify their grammars if the input becomes too opaque. All this is in line with the well known assumption that L1-acquisition is the main locus of language change (cf. Paul 1920: 34 §18, Lightfoot 1979: 375, Lightfoot 1998: 18). Moreover this is corroborated by the findings on L1-acquisition of negative polar 'need' verbs in Lin, Weerman, and Zeijlstra (2015) and Lin, Weerman, and Zeijlstra (2017), who show that L1-learner gradually acquire the various licensing contexts in which Dutch *hoeven* 'need' with clausal negation *niet* (2;) or negative quantifier *geen* 'no' (4;) before allowing more licensers from 7;00 onward. In other words, it takes much time until weak NPIs are acquired. Apart from that it will be demonstrated that individual speakers already reanalysed weak NPIs such as *brauchen* as distributionally unrestricted forms.

Finally, it will be shown here that there are 'need' verbs which are no longer strict NPIs but which still overwhelmingly occur in non-veridical environments such as the circumstantial uses in Norwegian *trenger* with infinitive (75/2) and *beøve* with infinitive (25/2) und to lesser extent Swedish *beöva* with infinitive (66/20). These facts suggest that NPI-hood is not even a binary feature but a gradual or probabilistic one.

Alternatively, it could be assumed that NPI-hood is not expressed by a lexical feature but a long the lines of Israel (1996: 630–631, 2011: 127–142) who suggest that sensitivity polarity can be explained in a pragmatic way in terms of scalar implicature. As Israel points out, 'need'-verbs encode endpoints of a scale thereby behaving like prototypical polarity sensitive items. The account outlined here remains agnostic to the question whether NPI-hood is expressed as a lexical feature or derived by pragmatic principles. But there has to be some information in the lexical entries which designates transitive uses of need verbs to be NPIs such as in Modern Dutch, but designates them to be distributionally unrestricted in languages like Modern Scandinavian or German.

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[2]NDC: bara_om3

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